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ABSTRACT

The Common Thread Case Project is a multi-year project that uses multimedia compact disc technology and high-bandwidth telecommunications to provide a unique, case-based professional development network for teachers in the midst of systemic reform in the state of Kentucky. The project is a partnership between the University of Kentucky, the University of Louisville, and Kentucky Educational Television. Year one of the project centered on the development of a series of five secondary and five elementary cases, available in hard copy and on CD ROM. Each case in the Common Thread Cases (CTC) series is a true story and captures the dilemmas and accomplishments of teachers involved in reform. The cases are designed for in-depth discussions that critically analyze pedagogy and promote reflection. Year two of the project focuses on training and dissemination of the case materials. The intent of the training is to provide teachers with case facilitation skills and technology to develop and support a professional community of teachers. The project also works with participants to explore telecommunications for ongoing professional development and collaboration. Questions considered are: (1) To what extent can the cases, along with accompanying study tools and resources and available telecommunications technology, become the nexus of a larger system of knowledge support that is essential for teacher professionalism? (2) What are the dimensions of such a knowledge support system? The report looks at: Background and Need for Knowledge Support; Cases and Teacher Professional Development; Knowledge Support and Performance Outcomes for Teacher Professionalism; Dimensions of an Open Knowledge Support System (instrumental, relational, and communication dimensions); and Future Directions. Appendix A contains the criteria a case study must meet for inclusion, and Appendix B illustrates some of the features of the case delivery system. (Contains 39 references.) (Author/SWC)

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Title:

Dimensions of a Knowledge Support System: Multimedia Cases and High Bandwidth Telecommunications for Teacher Professional Development

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The Common Thread Case Project is a multi-year project that uses multimedia compact disc technology and high-bandwidth telecommunications to provide a unique, case-based professional development network for teachers in the midst of systemic reform in the state of Kentucky.

The project, now in its second year, is a partnership between the University of Kentucky, the University of Louisville, and Kentucky Educational Television. Year one of the project centered on the development of a series of five secondary and five elementary cases, available in both hard copy and CD-ROM. Each case in the series, called The Common Thread Cases, is a true story and captures the dilemmas and accomplishments of teachers involved in reform. The criteria for the Common Thread Cases (CTC) have been fully described elsewhere (Bliss & Mazur, 1995a). However, the case criteria are salient to the present discussion and are reiterated in Appendix A.The cases are designed for in-depth discussions that critically analyze pedagogy and promote reflection. Year two of the project focuses on training and dissemination of the case materials. The intent of the training is to provide teachers with case facilitation skills and technology to develop and support a professional community of teachers. In addition to case facilitation training, the project also is working with participants to explore telecommunications for ongoing professional development and collaboration. Currently, we are examining two questions potentially crucial to the project's long-term success.

(1) To what extent can the cases, along with accompanying study tools and resources and available telecommunications technology, become the nexus of a larger system of knowledge support that is essential for teacher professionalism?

(2) What are the dimensions of such a knowledge support system?

Background and Need for Knowledge Support

Kentucky teachers face unique challenges. Now in its fifth year of implementation, the Kentucky Education Reform Act of 1990 (KERA) requires comprehensive reform in governance, finance, and curriculum. The reform includes an extensive technology initiative, the Kentucky Educational Technology System. The purpose of the statewide network is to improve instruction and support teacher professional development (Kentucky Master Plan for Technology, 1992) through the use of telecommunications and on-line resources. Schools are now required to provide high-end desktop computing in classrooms. An integrated wide-area network will connect all the states' school districts, colleges and universities, and governmental agencies. Such an extensive network in a largely rural state is intended, in part, to support the professional needs of teachers -- teachers who are expected to engage in new types of teaching (e.g., portfolio assessment) and problem-solving activities. For novice teachers, performance is now assessed through portfolios in which they demonstrate what they know and are able to do consistent with state adopted performance standards.

Several recent studies of the KERA implementation have stressed the need for more strategic professional development approaches (Robertson Associates, 1995). Teachers want more examples of new practices and ongoing support for incorporating new approaches (Mathews, 1995; Daniels & Stallion,1995). Moreover, to be more effective in meeting the needs of teachers, technology should be integrated into flexible professional development (Mazur, 1995).

Cases and Teacher Professional Development

Cases have been used for teacher professional development for some time and for a variety of purposes (Wasserman, 1993; Kagan, 1993; Kleinfeld, 1989). Among the most prominent uses of the case approach are (1) to support collaborative work between experts and novices and to compare differences in novice and expert approaches (Borko et al., 1992; Borko & Livingston, 1989), (2) to frame situational learning (Koschman et al, 1990) and (3) to examine expert decision making in complex, ill-structured domains (Spiro et al. 1988). In addition, cases contextualize problem solving? (Cognition and Technology Group, 1992, 1991; Risko, 1992b; Risko, Vount & Towell, 1991). However, electronic cases for educators (Fishman & Duffy, 1992, 1993; Desberg, Colbert & Trimble, 1995) have been developed only recently.

Each Common Thread Case CD-ROM contains the entire discursive text of the hard copy case transformed into a multimedia "animated narrative. That is, the text is augmented with accompanying non-discursive descriptive material consisting of high quality graphics, video clips and audio narration. These enhancements are intended to provide teachers with multiple ways of knowing the subject (Eisner, 1993). Strategic case content locators and graphical overviews provide several ways to navigate through the case content. A variety of tools and resources designed to supplement study and discussion of the case are also provided: Case discussion questions, exhibits such as lesson plans and examples of

students' work, case commentaries by teachers, administrators, and scholars, a case bibliography, and relevant articles are included. Each CD contains telecommunications shareware that facilitates the use of on-line networks to discuss questions or issues related to the case. A World Wide Web homepage for the project is also available (http://www.uky.edu/~borchyi/KERA.html).

Knowledge Support and Performance Outcomes for Teacher Professionalism

The Common Thread Cases are consistent with a proposed approach to upgrade teachers' skills is through integrating powerful new technologies with teacher professional development (Barron and Goldman, 1994)). However, many of the problems related to technology and productivity identified by business and industry have resurfaced in professional development for teachers (Lieberman & McLaughlin, 1992). For example, educators, like their counterparts involved in training for business and industry, have seen the poor results of one-shot, one-size-fits-all training that does not provide opportunities for ongoing practice and feedback on performance (Savage, 1994). To combat this problem new systems, termed on-line performance support systems, have been designed to link innovative applications to new learning, working, and collaboration paradigms (Schoenmaker, 1993). These systems have been described as *continuous learning environments* (Forman & Kaplan, 1994). That is, the system provides an array of integrated information resources such as references, guidance, or tools on the desktop that are under the users' control. Delivered via computer, this new generation of electronic performance support systems (Stevens and Stevens, 1995), provides immediately needed, task- and situation- specific information that is accessible from electronic? networks and/or multimedia databases. Using tailored navigational and indexing utilities, these systems can store vast amounts of information and embed training (Mullins, 1989) that can meet the needs of many users who may need the information for different reasons. The untapped strength of these new interactive and networked technologies lies in their potential to deal with complexity and sort out multiple factors involved in a problem (Savage, 1994).

What is the potential of these continuous learning environments for professional development in education? Despite some congruence with approaches generally termed constructivist (Duffy & Jonassen, 1993, Wilson, 1995), there remains significant conceptual differences between programs designed to support educational endeavors and the continuous learning environments used to support productivity in business and industry. One is the nature of the cognitive tasks involved in productive work. Teaching requires professional judgments regarding actual practice or technique that may vary widely in specific circumstances. Teachers' judgments requires what has been termed narrative, rather than paradigmatic, knowing (Bruner, 1991). There is no one set of prescribed rules or procedures that will work in any given set of circumstances.

Another aspect of the educational situation that is significantly different from business environments is that both novices and veterans are assigned similar tasks regardless of experience. That is, a first year teacher and a twenty-year veteran may both be teaching a class of mixed ability second graders in an urban school. While each has much to learn from the other, the time and opportunity are usually lacking to capitalize on the possibilities for mentoring or peer assistance (Little, 1991; Raney and Robbins, 1989). In addition, the traditional isolation of teachers has inhibited the sharing of pedagogical insights gained from experience.

The strategic role of dialogic conversation in enabling participants to create commonly shared meaning and to "transform their mindsets and think about change and education" has been recently conceptualized by Jenlink and Carr (1996 p. 34). Furthermore, Brown & Campione (1990) have described how essential a community of learners is to supporting critical thinking, reflection, and change. Specifically, networks of engaged participants can become the much-needed contexts for transforming practice.

Currently, there are a plethora of on-line services for teacher networking such as on-line discussion groups, bulletin boards, and extensive databases for information retrieval. But many users complain that electronic information is overwhelming, unfocused, or difficult to access (Harasim, 1990) and this perception has seriously limited the use of on-line resources for professional development. In their efforts to change practice, teachers need to engage in intensive, more structured professional communities and intellectual teamwork (Gallegher & Kraut 1991) than is now available. The Common Thread Case project seeks to begin addressing this issue through the integration of multimedia cases and telecommunications in an open, somewhat unstructured knowledge support system.

Dimensions of An Open Knowledge Support System

The knowledge support environment has to be robust enough to encourage thought and promote insight, open enough to allow users to raise topics that are personally relevant, and yet sufficiently focused to emphasize state-adopted teacher performance standards. The design of the knowledge support system must include three dimensions. These are:

(1) An Instrumental Dimension. The core content (the cases)and information contained in the resources must be rich enough to accommodate novice and experienced educators and appeal to a wide variety of experiences. Simultaneously, the performance standards, consistent with national standards, must play a prominent role. The design and presentation of information provides opportunities for studying complex pedagogy and offers multiple ways to access that information. Furthermore, the system's design should incorporate aesthetic aspects (Saito et al. 1995) that capitalize on the expressive potential of multimedia technology to motivate and engage the educational imagination described by Eisner (1986). The system also needs to be flexible and accessible to accommodate teachers' scheduling demands.

(2) A Relational Dimension. To enable the teacher to thoroughly analyze various aspects of a case as it relates to teaching standards as well as to theory and practice, the knowledge support system makes available integrative tools and resources. Examining, gathering, and linking information may involve questioning or clarifying the case situation, identifying key points, or seeking further information about case topics. Tools to help teachers elaborate on issues raised and double checking information--all of which are instantly available within the case program, comprise a relational dimension to knowledge support system that is structured not by the program's sequence but by the questions, interests, or concerns of the user.

(3) A Communication Dimension. The system incoporates tools that encourage and enable teachers to communicate their analysis of the case issues to others who have also used the case. Teachers can revise and create new ideas, capitalize on the experiences of others who may have tested ideas from the case and engage in the critical discourse so essential to the development of professional communities.

The chart below illustrates how prominent case features and telecommunications tools shown in Appendix B comprise various dimensions of the open knowledge support system.

Instrumental	Relational	Communication
Case content and accompanying visuals	Discussion Questions	Notebook
Exhibits	Explore Issues and Standards	E-mail tools
Case Commentary	Case Content Locator	Web site Desktop Video Conference
State & National Performance Standards	Where Am I? Navigator	
Bibliography/ Articles		

Future Directions

The program has been field tested with approximately fifty new and experienced Kentucky teachers. The most obvious issues emanating from the field tests concern the communications dimension of the knowledge support system. Not surprisingly, users were uncomfortable with initiating on-line video conferences with strangers. Also, the notion of on-going professional development carried out via electronic mail was, in fact, so foreign to most teachers that they had difficulty incorporating contacts with other teachers into their routines. Just as workers in business and industry had to adjust work habits to truly utilize the highly accessible resources in continuous learning environments, teachers apparently need encouragement and follow-up on the use of on-line forums and databases to support their work and professional development activities. Most importantly, the issue of sustainability was raised. What is necessary to maintain professional conversation and community once it has been initiated?

At this point in the implementation of the Common Thread Case project, the communications dimension needs careful investigation. As our research proceeds we will be examining which resources are most suited to supporting aspects of professional discourse. For example, will features of teleconferencing be more valuable for certain types of discussions, or only as the initial contacts for collaboration? What kinds of discussion will be best suited for e-mail? Will the World Wide Web forum or two-way video conferencing be the most effective model for study group discussion ? What additional resources, not yet available as part of the existing system, will teachers need and want? As refinements to the development of the communications dimension of the knowledge support system proceed, we hope to develop dynamic models for open, somewhat unstructured communities that empower teachers in their efforts to improve practice through conversation and community.

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Appendix A

The Common Thread Case Criteria

Each Common Thread Case contains four elements:

1. A well formulated narrative structure (Connelly & Clandinin, 1990)

2. A true, factually correct, compelling acocunt. The authenticity of the case is essential and strategic, as suggested by Phillips (1994), who notes that one is more likely to accept what is true and more likely to be successful when what one acts upon is correct.

3. Tangible episodes of good teaching. Teaching episodes must include the particulars that become tangible to the reader. The importance of rich contextual details has been thoughtfully described elsewhere (Eisner, 1990).

4. Consequential Aspects of Standards-Based Practice. Each case includes events that are relevant to teacher performance standards. These standards are not models, but frames of reference. The holistic nature of teaching implies that various standards will often apply and even overlap in the same case.

'Animated' narrative components
Elaine Temkin
Discussion Questions
Bibliography
Case Content Map
Explore Standards
Instructional
Provides topical overview of case
Commentary on reform and standards. Includes all Kentucky Performance Standards
Bibliography and a matrix of the CTC Case Series
Navigator to display Case Components
Online word processor where notes can be printed out
Launches E-mail and video conferencing tools
Online 'baloon' help

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